

**IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF TEXAS  
TYLER DIVISION**

**THE PACID GROUP, LLC,**

**Plaintiff,**

**v.**

**APPLE, INC., ET AL.,**

**Defendants.**

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**CIVIL ACTION No. 6:09cv143-LED-JDL**

**REPORT AND RECOMMENDATION OF  
UNITED STATES MAGISTRATE JUDGE**

In this case, Plaintiff The PACid Group, LLC (“PACid”) accuses Defendants Atheros Communications, Inc., Broadcom Corporation, Intel Corporation, and Marvell Semiconductor Inc. (collectively, “Defendants”) of patent infringement. Before the Court is Defendants’ Motion for Summary Judgment of Invalidity of claims 12 and 26 of U.S. Patent No. 5,963,646 (“the ‘646 patent”) (Doc. No. 264) (“Motion”), and Reply in Support, (Doc. No. 277) (“Reply”). PACid has filed a Response (Doc. No. 271) (“Response”). The Court held a hearing on the Motion on March 25, 2010 at the time of the *Markman* hearing. For the reasons stated below, the Court **RECOMMENDS** that Defendants’ Motion be **DENIED**.

**BACKGROUND**

The ‘646 patent describes a method and system for generating deterministic, symmetric encryption keys that are resistant to attempts to decipher encoded communications. *See* ‘646 patent at 3:18–23. Specifically, the patent proposes a key generator that uses a secure hash to generate symmetric keys. *See id.* at 3:1–6; 3:19–30; and 4:55–5:5.

The encryption key generator obviates the need for key management systems, and the ‘646

patent discloses a process that is highly resistant to “brute force trial-and-error cryptanalytic attempts recreate an encryption key.” See ‘646 patent at 4:55–59. Figure 3 illustrates a functional block diagram of an encryption key generator system disclosed in this patent. ‘646 patent at 6:43–44. Among the structures disclosed in this Figure is a “interrupt control 104.”<sup>1</sup> The role of this disclosure in Figure 3 in relation to the claim language is disputed in this Motion. What is affirmatively presented in Figure 3, however, is a communication bus that is electrically connected to an I/O interface unit, which is in turn electrically connected by conducting line to an interrupt control unit. The interrupt control unit that will be discussed herein is then electrically connected to an 8 bit, 4.0 MHz CPU. See

‘646 patent at 6:44–51; and Fig. 3.

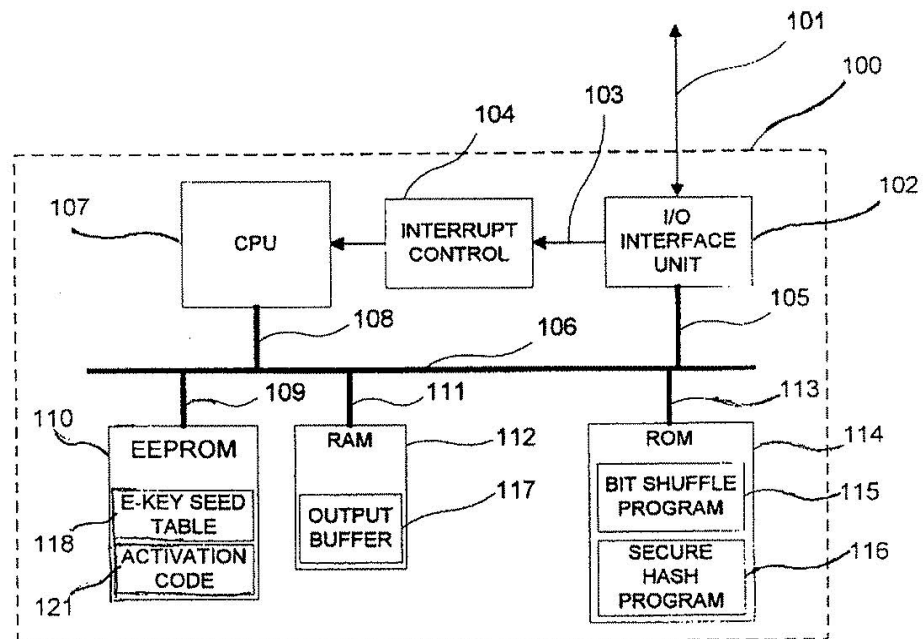


FIG. 3

<sup>1</sup> As presented by Defendants and not challenged by PACid, among those skilled in the art of computer design, the term “interrupt” refers to “a signal that, when received by a computer processor running one or more program, causes the processor or program to suspend its operation temporarily in such a way that the operation can later be resumed.” RESPONSE at 4.

The claims of the ‘646 patent are directed to particular aspects of generating the encryption key. The instant dispute focuses on claim references to the “interrupt control” in claims 12 and 26. A limitation in claim 12 recites “interrupt control means. . . for issuing an interrupt control signal upon receipt of said command sequences,” ‘646 patent at 9:55–57, and Claim 26 then requires “the system of claim 12, wherein said pseudo-random, symmetric encryption key also is deterministic and non-predictable.” *Id.* at 10:58–60. Defendants challenge that these claims are indefinite because there is insufficient mention of “interrupt control” or “interrupt control unit 104” in the ‘646 patent to allow a skilled artisan reviewing the limitations to understand the precise structure that performs the claimed function.

### **LEGAL STANDARD**

#### ***Summary Judgment Standard***

“Summary judgment is appropriate in a patent case, as in other cases, when there is no genuine issue as to any material fact and the moving party is entitled to judgment as a matter of law.” *Nike Inc. v. Wolverine World Wide, Inc.*, 43 F.3d 644, 646 (Fed. Cir. 1994); FED. R. CIV. P. 56(c). The moving party bears the initial burden of “informing the district court of the basis for its motion” and identifying the matter that “it believes demonstrate[s] the absence of a genuine issue of material fact.” *Celotex Corp. v. Catrett*, 477 U.S. 317, 323, 106 S.Ct. 2548, 2553 (1986). If the moving party meets this burden, the nonmoving party must then set forth “specific facts showing that there is a genuine issue for trial.” FED. R. CIV. P. 56(e); *see also T.W. Elec. Serv., Inc. v. Pacific Elec. Contractors Ass’n*, 809 F.2d 626, 630 (9th Cir. 1987).

#### ***Applicable Law***

A party seeking to invalidate a patent must overcome a presumption that the patent is valid.

*See* 35 U.S.C. § 282; *United States Gypsum Co. v. National Gypsum Co.*, 74 F.3d 1209, 1212 (Fed. Cir. 1996); *Hibritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1375 (Fed. Cir. 1986). This presumption places the burden on the challenging party to prove the patent’s invalidity by clear and convincing evidence. *United States Gypsum Co.*, 74 F.3d at 1212. Close questions of indefiniteness “are properly resolved in favor of the patentee.” *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1348 (Fed. Cir. 2005); *Exxon Research & Eng’g Co. v. United States*, 265 F.3d 1371, 1380 (Fed. Cir. 2001).

35 U.S.C. § 112 requires that claims be particular and distinct. “The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.” 35 U.S.C. § 112, ¶ 2. The primary purpose of the requirement of definiteness is to provide warning to those skilled in the art of what will constitute infringement. *See United Carbon Co. v. Binney Co.*, 317 U.S. 228, 236 (1942). The definiteness standard is one of reasonableness under the circumstances, requiring that, in light of the teachings of the prior art and the invention at issue, the claims apprise those skilled in the art of the utilization and scope of the invention with a reasonable degree of precision and particularity. *See Shatterproof Glass Corp. v. LibbeyOwens Corp.*, 758 F.2d 613, 624 (Fed. Cir. 1985). To rule “on a claim of patent indefiniteness, a court must determine whether one skilled in the art would understand what is claimed when the claim is read in light of the specification.” *Bancorp. Servs., L.L.C. v. Hartford Life Ins. Co.*, 359 F.3d 1367, 1372 (Fed. Cir. 2004). “A determination of indefiniteness is a legal conclusion that is drawn from the court’s performance of its duty as the construer of patent claims, [and] therefore, like claim construction, is a question of law.” *Amtel Corp. v. Info. Storage Devices, Inc.*, 198 F.3d 1374, 1378 (Fed. Cir. 1999).

A claim limitation expressed in “means plus function” language is governed by 35 U.S.C. § 112, ¶ 6. *Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424 (Fed. Cir. 1997). This statute was intended to permit use of means expressions without recitation of all the possible means that might be used in a claimed apparatus. *O.I. Corp. v. Tekmar Co.*, 115 F.3d 1576, 1583 (Fed. Cir. 1997). “If there is no structure in the specification corresponding to the means plus function limitation in the claims, the claim will be found invalid as indefinite.” *Biomedino, LLC v. Waters Techs. Corp.*, 490 F.3d 946, 950 (Fed. Cir. 2007). “This duty to link or associate structure to function is the *quid pro quo* for the convenience of employing § 112, ¶ 6.” *Default Proof Credit Card Sys., Inc. v. Home Depot U.S.A., Inc.*, 412 F.3d 1291, 1298 (Fed. Cir. 2005).

If a patent claim contains a means plus function limitation, the patent specification must actually disclose structure capable of performing the specified function. *See id.* at 1300–02 (finding that numerous structures proposed by Plaintiff as corresponding structures either did not perform the recited function or were not disclosed in the specification); *see also Biomedino, LLC*, 490 F.3d at 950 (finding a means plus function term indefinite where the alleged corresponding structure was a box labeled “control” and the specification explained that the control function may be accomplished “by known differential pressure, valving and control equipment”). “The inquiry is whether one of skill in the art would understand the specification itself to disclose structure, not simply whether that person would be capable of implementing a structure.” *Id.* at 953. Structure that merely enables other structure to perform the recited function is not corresponding structure. *Asyst Techs., Inc. v. Empak, Inc.*, 268 F.3d 1364, 1371 (Fed. Cir. 2001) (“An electrical outlet enables a toaster to work, but the outlet is not for that reason considered a part of the toaster.”). Furthermore, structure disclosed in the specification must be “clearly linked” to the function recited in the claim.

*Medtronic, Inc. v. Advanced Cardiovascular Sys., Inc.*, 248 F.3d 1303, 1313 (Fed. Cir. 2001); *Med. Instrumentation and Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1218–19 (Fed. Cir. 2003).

### **THE PARTIES' CONTENTIONS**

The parties agree that the function for the claim language at issue is “issuing an interrupt signal upon receipt of command sequences.” ‘646 patent at 9:55–57. The parties dispute whether the ‘646 patent discloses sufficient structure for an “interrupt control unit” to perform the recited function.

#### ***Defendants' Contentions***

Defendants challenge the definiteness of claims 12 and 26. They contend that the claims incorporate a mean plus function limitation, but that the ‘646 patent specification refers to terms—“interrupt control” and “interrupt control unit”—that are not structural, but are instead functional elements that can be performed in a computer system in numerous ways. MOTION at 4–5 (providing examples of classes of interrupts such as “level-triggering interrupt” and “edge-triggered interrupt”). Under this theory, Defendants conclude that an engineer seeking to implement interrupts in a computer system would be unable to understand the precise structure in the ‘646 patent that performs the claimed function. *Id.* at 5–6; and 12–15.

Defendants specifically assert that the “interrupt control 104” disclosed in Figure 3 does not provide sufficient technical details about the structure to link it to the recited function and Defendants further suggest that the text of ‘646 patent specification is also insufficient in identifying the structure linked to the functional language. MOTION at 13–15.

#### ***PACid's Contentions***

PACid first argues that one of ordinary skill in the art understands that the term “interrupt

control” refers to structure, and therefore, is not governed by 35 U.S. C. § 112, ¶ 6. RESPONSE at 1. PACid offers expert testimony asserting that “the use of the term ‘said interrupt control’ in claim 12 indicates that the initial use of word ‘means’ in conjunction with ‘interrupt control’ was incidental. *Id.* PACid contends that the claim itself “refers back to” “*said interrupt control*” and not “*said interrupt control means*,” thereby referring only to “interrupt control” and omitting the word “means.” RESPONSE at 8. PACid presents an example of comparative drafting in “I/O interface means” to argue that the patentee did not intend to invoke § 112, ¶ 6. *Id.*

In the alternative, PACid asserts that even if claim 12 is governed by § 112, ¶ 6, the claim is valid because the specification discloses structure in the form of “interrupt control unit 104” and appropriately links that structure to the recited function. RESPONSE at 9. Citing relevant portions of the specification, PACid contends that “interrupt control unit 104” is sufficiently detailed in the context of the patent, and Figure 3, in particular, conveys to one of skill in the art that “interrupt control unit 104” is structure to perform the function of issuing an interrupt signal upon receipt of commands. To support its position that a skilled artisan would understand the claim limitation as including hardware (i.e. one of the interrupt controllers commercially available at the time the patent issued), PACid relies on testimony of its expert, Dr. Cantrell. *See id.* at 11–13; and 17. Should the Court construe the claim term as a means plus function limitation, PACid proposes that the corresponding structure to the agreed upon function is “interrupt control unit 104” and its equivalents. *Id.* at 17.

## DISCUSSION

### ***Section 112, ¶ 6 Governs the Claim Limitation: “interrupt control means”***

The use of the term “interrupt control means” in the claim limitation requires a structure that links the recited means to recited function. In this case, the parties dispute whether 35 U.S.C. § 112, ¶ 6 is applicable, but a review of the claim language in light of the statute suggests an attempt to disclose both structure and function. When a term modifies “means,” courts examine whether the modifier itself is known to connote “sufficient structure to a person of ordinary skill in the art.” *Mass. Institute of Technology & Elecs. for Imaging, Inc. v. Abacus Software, Inc.*, 462 F.3d 1344, 1354 (Fed. Cir. 2006). Here, because claim 12 uses the word “means” in connection with a claimed function, there is a presumption that this limitation falls within 35 U.S.C. § 112, ¶ 6. *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1366 (Fed. Cir. 2008). Evaluating claim terms analogous to those presented here, the Federal Circuit has held that in order to overcome the presumption that § 112, ¶ 6 applies, a patentee must prove that the claim itself, and not just the specification, recites sufficient structure to perform the claimed function. *Id.*; *Callicrate v. Wadsworth Manufacturing, Inc.*, 427 F.3d 1361, 1368–69 (Fed. Cir. 2005) (finding that the patentee could not overcome a § 112, ¶ 6 presumption for the claim term “cutting means for cutting elastomeric ligature material”); *Signtech USA, Ltd. v. Vutek, Inc.*, 174 F.3d 1352, 1356 (Fed. Cir. 1999) (holding that no structure appears in the limitation “ink delivery means”). A plain reading of claim 12 does not disclose sufficient structure for performing the claim’s function.

PACid argues that “interrupt control” connotes a well-known structure in the art, but Plaintiff lacks the necessary objective evidence to rebut the presumption that this is a means plus function limitation. To make such a showing, PACid would be expected to produce passages from the file



history, textbooks, or a dictionary definition that confirmed that a well-known “interrupt control” performs the entirety of the function of “issuing an interrupt signal upon receipt of said command sequences.” *Mass. Institute*, 462 F.3d at 1354 n.5 (“It is appropriate to look to dictionaries to determine if a disputed terms has achieved recognition as a noun denoting structure.”) (citing *Lighting World, Inc. v. Birchwood Lighting, Inc.*, 382 F.3d 1354, 1360–61 (Fed. Cir. 2004)). PACid presents the interpretation of one of ordinary skill in the art to suggest that “interrupt control” refers to a structure, but acknowledges that the claim term could refer to a function in some contexts<sup>2</sup> weighs against finding this evidence overcomes the presumption that the patentee was claiming a means step for performing a specified function. *See* 35 U.S.C. § 112, ¶ 6.

***The ‘646 Patent Specification Discloses Sufficient Structure to Support a Definite Meaning for “interrupt control means”***

Finding that § 112, ¶ 6 applies to this limitation, the Court engages in a two-step inquiry. The Court inquires as to whether structure is described in the specification, and, if so, whether one of skill in the art would identify the structure from that description. *Atmel Corp. v. Information Storage Devices, Inc.*, 198 F.3d 1374, 1379 (Fed. Cir. 1999). As a preliminary matter, the specification links a structure with the recited function. The block diagram in Figure 3 illustrates a box labeled “interrupt control unit.” This Figure comports with a specification passage disclosing that the interrupt control unit performs the recited function:

In operation, a host system (not shown) inputs commands and data to the key generator system 100. . . When information from the host system is written in to the I/O interface unit 102, **an interrupt is generated by the interrupt control unit 104.**

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<sup>2</sup> Defendants produced an e-mail in which Dr. Cantrell stated that the “interrupt control means” limitation was “plausibly means-plus-function” language. *See* REPLY, EXH. F (Doc. No. 277-2) (citing an e-mail that is dated March 18, 2010, seven days prior to the *Markman* hearing in this case). He also testified that there are some contexts in which the two words “interrupt control” can be understood as a function. *See* REPLY, EXH. E, CANTRELL DEPO. TESTIMONY at 104 (Doc. No. 277-1).

‘646 patent at 6:63–7:1 (emphasis added). The specification further states that the “Interrupt control unit 104 is electrically connected to an 8 bit, 4.0 MHz CPU” and that the I/O interface unit is “electrically connected by way of a conducting line 103 to an interrupt control unit 104. . .” *See id.* at 6:43–7:6 and 8:3–13.

Taken as a whole, this description explains how the interrupt control unit works in relation to the larger system for generating an encryption key, but does not elaborate on the internal circuitry of the “interrupt control unit.” In not disclosing the internal workings of the “interrupt control unit,” Defendants compare Figure 3 to the proverbial “black box” found indefinite in *Biomedino*. *REPLY* at 6–7 (discussing *Biomedino*, 490 F.3d at 953). This argument was also made at the hearing when Defendants maintained that the “interrupt control” contained in the block diagram of Figure 3 is an “empty box.” Contrary to Defendants’ assertions that the written description does not disclose any details about structure or operation of “interrupt control unit 104,” the Court finds that one skilled in the art would understand what is claimed when the claim is read in light of the specification.” *See Bancorp. Servs., L.L.C. v. Hartford Life Ins. Co.*, 359 F.3d 1367, 1372 (Fed. Cir. 2004) (recognizing that the disputed phrase is reasonably discernible because its components had well-recognized meanings that rendered the claim term definite).

First, the patentee has adequately identified the structure in Figure 3 and an accompanying discussion that corresponds to the claimed function. Thus, the patentee has “paid the price” for functional claiming under 35 U.S.C. § 112, ¶ 6. *Default Proof Credit Sys. Inc. v. Home Depot U.S.A., Inc.*, 412 F.3d 1291, 1298 (Fed. Cir. 2005) (“This duty to link or associate structure to function is the *quid pro quo* of employing § 112, ¶ 6.”). Figure 3 discloses numerous boxes comprised of hardware that disclose structure to perform the larger process. For example, the box diagram shows

not just an “interrupt control,” but also an I/O interface unit, a CPU and an EEPROM. Particularly, in this context, the interrupt control unit is clearly a hardware structure with specifically claimed structural connections to other elements of the claimed system.

Additionally, when examining the specification passages associated with “interrupt control unit 104,” even Defendant’s expert witness stated that he thinks “there’s some hardware inside that box,” he additionally stated that he thinks that hardware is connected to hardware in the CPU, and he also stated that the hardware in the “interrupt control 104” in Figure 3 is “connected to some hardware in the interface unit.” RESPONSE, EXH. 13, GIZA DECL. at 98:14–99:7 (Doc. No. 271-13) (“Mercer Depo”) (offering an opinion interpreting the box labeled “Interrupt Control 104” in the context of Figure 3 in the ‘646 patent). This testimony from Dr. Mercer undercuts Defendants arguments under *Biomedino* that the written description fails to inform a skilled artisan as to what supporting structure corresponds to the means limitation. Cf. MOTION at 10–15. Dr. Mercer’s testimony indicates that the patentee’s disclosure is adequate to reasonably infer the structural underpinnings of “interrupt control 104.”

It should further be noted that this specification is distinguishable from a situation where this Court previously found insufficient structure. See *Saxon Innovations, LLC v. Nokia Corp.*, No. 6:07-cv-490, 2009 WL 3161403, at \*5 (E.D. Tex. Sept. 29, 2009) (Love, M.J.). In *Saxon*, the disputed circuitry was never elaborated upon in the specification and there was a lack of testimony that one of skill in the art would *understand* the specification itself to disclose structure. *Id.* at \*4–5. In that case, Saxon improperly argued that a skilled artisan would be capable of implementing the identified structure. As pointed out by the Federal Circuit, this reasoning is inapposite and the Court’s holding clarified that the proper analysis focuses on whether the specification satisfies § 112, ¶ 6. *Id.* at \*5

(citing *Biomedino, LLC*, 490 F.3d at 953). Finding that the identified structure did not correspond to the recited function, the claim was held indefinite. Here, the patent teaches that the “interrupt control unit 104” generates the interrupt claimed in the function. One of ordinary skill in the art would understand that there was hardware inside the “interrupt control unit 104” to execute the claim and the Court need not reach the same result as the *Saxon* case.

Next, Defendants have also failed to prove by clear and convincing evidence that “interrupt control unit” is not the name of a well-known structure with a definite meaning. REPLY at 9. Instead, PACid has put forth sufficient evidence to demonstrate a reasonable degree of precision and particularity for this claim term. *See Shatterproof Glass Corp. v. Libbey Owens Corp.*, 758 F.2d 613, 624 (Fed. Cir. 1985). While Defendants emphasize that the ‘646 patent “invites one of ordinary skill in the art to design his own interrupt control mechanism” and fails to disclose “any precise structure or way” to implement the claimed function, the evidence of record does not support these conclusions.

Describing the block diagram of Figure 3, the ‘646 patent specification describes the operation of an “interrupt control unit” as it would have been generally understood to by one of skill in the art in the late 1990s. PACid has demonstrated that “interrupt controllers” were not only commercially available at the time this patent was filed, but the term connotes a common circuit that carries an ordinary meaning in the field of computer architecture. This accepted meaning is also consistent with the language in the specification. *See* RESPONSE at 11 (relying on ‘646 patent at 6:43–7:6; 8:3–13; and Fig. 3); *see also* THE AUTHORITATIVE DICTIONARY OF IEEE STANDARDS TERMS 583 (7th ed. 2000). Notably, even if there are multiple possible configurations of the “interrupt control unit” structure, the selection of a particular configuration would be a matter of

design choice that neither impacts the novelty of the ‘646 patent nor the application of claim 12. *See Intel Corp. v. VIA Tech., Inc.*, 319 F.3d 1357, 1366 (Fed. Cir. 2003) (holding that a patent was not indefinite where the specification disclosed “core logic” but did not disclose any specific circuitry) (citing *S3, Inc. v. NVIDIA Corp.*, 259 F.3d 1364, 1370–71 (Fed. Cir. 2001)). If this patent was specifically disclosing to the public the invention of an interrupt controller, more detail would be required; however, the Federal Circuit has not required the level of specificity advocated by Defendants in performing the claimed function. *See, e.g., Intel*, 319 F.3d at 1366 (“We hold that the ‘291 patent is not indefinite merely because no specific circuitry is disclosed to show the modification.”). Although various types of interrupt control units could effectively carry out the claimed function, all of those types fall within the narrow realm of hardware interrupt controllers, which are well known to skilled artisans. Thus, a person of ordinary skill would still understand with reasonable precision what was being claimed in the context of generating an encryption key.

Lastly, in the description of the preferred embodiment, the patent teaches that the system in Figure 3 “may be purchased as part number MC68HCO5SC28” from Motorola. ‘646 patent at 7:23–29. This teaching offers additional guidance as to the structure that performs the claimed function because the ‘646 patent identifies a specific part that includes the structure of the “interrupt control unit.” While the disclosure of the Motorola chip directly allows for the implementation of the claimed system,<sup>3</sup> it nonetheless also offers contextual guidance to a person of ordinary skill in the art when evaluating the structure underlying an “interrupt control unit.” In particular, the Court

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<sup>3</sup> As discussed in *Biomedino*, the implementation of a system described in the patent is not controlling in a definiteness inquiry. 490 F.3d at 953. As discussed previously, this Court has rejected arguments suggesting that a claim is definite if a skilled artisan would be capable of implementing the identified structure. *Saxon*, 2009 WL 3161403, at \*5.

finds that the specification's reference to the Motorola chip example clearly conveys that the "interrupt control unit" is a hardware structure.

In sum, since the claims of a patent are afforded a statutory presumption of validity, a challenge to a claim containing a means plus function limitation requires a more persuasive showing that there is a lack of structural support than what was presented here. Accordingly, Defendants' indefiniteness challenge fails and the Court construes the claim term as a matter of law. As provided in the Appendix attached to the Court's Provisional Claim Construction Order and full *Markman* Opinion, the construction for "interrupt control means" is composed of a function and corresponding structure. The recited function is "issuing an interrupt signal upon receipt of command sequences." The corresponding structure is "interrupt control unit 104."

#### **CONCLUSION**

The Court **RECOMMENDS** that Defendants' Motion for Summary Judgement (Doc. No. 264) be **DENIED**.

Within fourteen (14) days after receipt of the Magistrate Judge's Report, any party may serve and file written objections to the findings and recommendations contained in the Report. A party's failure to file written objections to the findings, conclusions and recommendations contained in this Report within fourteen (14) days after being served with a copy shall bar that party from *de novo* review by the district judge of those findings, conclusions and recommendations and, except on grounds of plain error, from appellate review of unobjected-to factual findings and legal conclusions accepted and adopted by the district court. *Douglass v. United States Auto. Ass'n*, 79 F.3d 1415, 1430 (5th Cir. 1996).

**So ORDERED and SIGNED this 15th day of July, 2010.**